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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • DECEMBER 2, 1944



General's Birds
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A SCIENCE SERVICE PUBLICATION

BOTANY

"Impossible" Hybrids

Plant crosses long considered impossible are now being obtained through control over reproductive processes at six vital points.

► PLANT HYBRIDS long considered impossible are now being obtained through control over reproductive processes made possible by better botanical knowledge, Dr. Albert F. Blakeslee, director of the Smith College Genetics Experiment Station, told the meeting of the American Philosophical Society, held in Philadelphia. This control is exercised at six vital points where failure may occur, which the speaker outlined:

1. Species may have flowering times too far apart for the pollen of one to be available when the flowers of the other come into bloom. This can often be overcome by artificial control of the length of day, hastening or delaying the flowering of either or both parent plants.

2. A flower receiving alien pollen may not supply the proper chemical stimulus to make the grains germinate. This chemical aid may be artificially supplied.

3. After germination, the tube produced from the pollen grain may burst

after growing part way down into the tissues of the pistil. This may be prevented by seeing to it that the pollen-receiving flower belongs to a species having more chromosomes per cell than the male or pollen-producing plant.

4. Fertilization may fail to occur despite pollen-tube growth; but Dr. Blakeslee has not experienced this difficulty in the species with which he is working.

5. Fertilization may occur but the embryo plant within the seed may be too feeble to grow. This has been overcome by carefully dissecting the embryo out of the seed and growing it as an "incubator baby" on nutrient media in gelatin capsules.

6. The offspring from wide crosses are frequently sterile "mule plants." Such mule plants may be rendered fertile and become pure-breeding new species through doubling their chromosome numbers by treatment with colchicine.

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NUTRITION

Short Food Rations

Millions of people in Europe have been on diets with an average caloric intake less than 75% of the normal prewar level.

► MILLIONS of people in Europe have been on short food rations during the war, with an average caloric intake less than 75% of the normal prewar level, although the farm output in terms of calories has been maintained higher than expected by many earlier in the war. The shortage has been particularly in France, Belgium, Norway, Italy, Spain, Yugoslavia, Greece and Poland. The farm population for the most part has been fed at or near prewar levels. Farm production has shifted definitely from livestock products to food crops.

These are the conclusions of Eric Englund of the Office of Foreign Agricultural Relations, U. S. Department of Agriculture, based on findings made by his office on food production in Europe and the probable European food situation im-

mediately after the war has ended.

"In Western Europe and North Africa," he says, "farm production of cereals for food, in terms of calories, in 1942-43 was near prewar levels. Fruit and vegetable production increased about 8%, edible oil crops about 17%, sugar crop changed little. Total food crops registered a slight advance in caloric equivalent. Indications are that production of food crops in 1944 will be about as in 1943."

"On the other hand, Europe's production of livestock products in 1942-43 was about 25% below prewar level; milk production about 15% and the production of poultry and eggs about 34% below the prewar average."

At present levels of production and with the curtailment of imports, he con-

tinues, per capita consumption of food in continental Europe now averages not more than from 85% to 90% of prewar, with a drastic reduction in the qualitative composition of food supplies. Among individual countries and population groups, conditions vary widely.

"The decline in average per capita consumption has been especially marked in Norway and Belgium," he states, "which were only about 50% self-sufficient before the war, in Greece and in France where supplies were diminished not only by a sharp cut in imports but also by a drop in food production and by shipments to Germany."

The Netherlands, which normally depends on imports for 30% of its food, was forced to plow up for crops over 20% of its pastures, which in ordinary times covered one-half of its farmlands. At least 25% of its cattle and 75% of its pigs were slaughtered because of a shortage of feed. Now thousands of acres have been flooded with sea water and a still greater shortage of foods is faced.

"In order to improve considerably the diet of the Allied European countries soon after the war," Mr. Englund declares, "large quantities mainly of cereals and fats would be needed in addition to supplies available on the Continent. . . . It has been estimated that this would require an annual rate of imports into continental Europe of from 5 to 10 million tons of wheat and perhaps one million tons of fat." Meat, dairy and poultry products will also be needed.

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ENGINEERING

Device Helps to Locate Defective Insulation

► A NEW defective-insulation-detecting device developed for military use now saves tons of valuable telephone wire that might otherwise go to waste, the War Department has announced.

Developed by Staff Sergeant Pasqual L. Wamil, a native of the Philippines, the device consists of a control box and a series of electrodes through which the tested wire is passed. The electrodes are shaped like tubes, with a funnel at both ends for smoother passage of the wire.

Whenever there is a break in the insulation, as the wire is passed through the tubes a spark jumps between the electrodes and the wire, which has current passing through it, causing a warning bell on the control box to ring. It is then simple to locate the defect.

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ENGINEERING

Railroad Gas Turbines

May be widely used in future locomotives; engines can haul 15 cars weighing 1,000 tons as fast as 95 miles-an-hour when two units are used.

► **GAS TURBINES** in railroad locomotives may be widely used in the future. Investigations show that they have sufficient natural advantages to assure them a place of recognition for such use, declared J. T. Rettaliata of the Allis-Chalmers Manufacturing Company at the meeting of the American Society of Mechanical Engineers in New York.

The speaker gave details of a 4,800 horsepower electric-drive locomotive, powered by two gas-turbine units. Its top speed when hauling 15 cars weighing 1,000 tons is 95 miles per hour on a tangent level track. Its maximum speed with a single engine in operation, he said, would be approximately 70 miles per hour.

Operation of the locomotive is economical. "The absence of water in the cycle is a natural advantage for railroad service," Mr. Rettaliata said. "The low maintenance record associated with the oil refinery gas-turbines of similar design encourages the present contemplation that the service charges on locomotive units will be correspondingly moderate. As is characteristic with all equipment of the turbine type, lubrication costs should be exceedingly small and, it is estimated that they will be less than one per cent of the fuel costs."

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Air-Cooled Condensers

► **THE USE** of air-cooled steam condensers on mobile electric power plants where water cooling is impossible was described at the same meeting by R. A. Bowman of the Westinghouse Electric & Manufacturing Company. In connection with the rehabilitation of wartorn areas of the world, he said, there is need for power plants that can be moved easily from one locality to another and put in operation in a short period of time. In some places where they will have to operate water for cooling will not be available.

To meet this condition a number of power trains have been built to use air as a cooling medium rather than water. "Tests on the air-cooled condenser for the power train indicate that such a

condenser is entirely practical," the speaker declared. "Because of the poor heat transfer properties and the low specific heat of air, such a condenser in general requires higher auxiliary power, greater investment and higher back pressure on the turbine than would the usual water-cooled condenser." For these reasons its use will probably be confined to places where water is not available.

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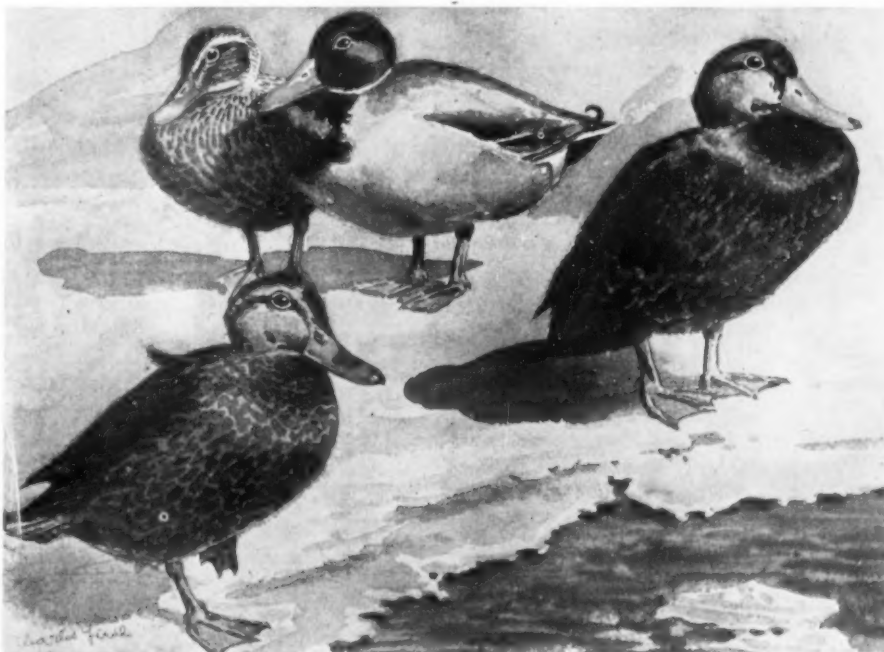
Postwar Industry Problems

► **INDUSTRY** will face a problem in postwar days to determine which of the many substitute materials developed and used to meet war shortages are of permanent advantage, declared Archibald Black of Simmonds Aerocessories, Inc., at the meeting. This will be particularly true in the metal fields, he told the meeting.

"When these war shortages have passed into history—a condition that is very close to attainment already—we may expect to see extensive jockeying for position on the part of producers of widely different materials," he stated. "In some cases the substitutions have come to stay, for unexpected advantages have resulted; in others we will revert to the time-tried ones; in still others it may take years to decide which wins out. Some materials are 'naturals' for certain applications, just as others are inherently substitutes and still others are thoroughly satisfactory alternates deserving of equal consideration."

Pointing out some of the new developments, Mr. Black said: "The developments of the past ten years have included new methods of heat treating that revolutionized the hardening of steel. It is now possible greatly to improve the ductility of steel without loss of strength by merely interrupting the quench and holding the metal at a suitable intermediate temperature until its transformation is complete."

Some of the powerful new magnetic alloys are ductile, he continued, and some new aluminum alloys have over one-third more strength than the ordinary steel of 30 years ago. Magnesium has now appeared as a serious competitor for light strong metals. Tungsten



DUCKS IN WATER COLOR—Among the paintings by Charles Liedl now on display in a one-man show at the Heads and Horns Museum Gallery, Bronx Zoo, New York City, is this one of mallard and black ducks. The paintings will be shown until January 1.

carbides and some other carbides cemented together with cobalt have revolutionized the machining of metals.

"Synthetic rubbers have been developed, which, in certain respects, surpass natural rubber," Mr. Black declared. "Production of these rubbers has reached a point sufficient to take care of all domestic requirements under ordinary conditions; no longer are we dependent

on imported rubber. Entirely new plastics have appeared, each with its own special characteristics, some having exceptional clearness resembling crystal, others can stand temperatures that run far beyond boiling point of water. Plastics, reinforced with glass threads, are being used experimentally for airplane construction."

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ENGINEERING

Should Stay on the Job

Regardless of their understandable desire to fight, technical men are urged to remain on the industrial and research fronts where they are most needed.

► YOUNG technical men, regardless of their understandable desire to fight, must not be siphoned off to the armed forces but must remain where they are most needed—on the industrial and research fronts. This is one of the great lessons learned in the present war and it must not be forgotten in the future, declared Col. Bradley Dewey, former U. S. Rubber Director, at a joint meeting of the American Section of the Society of Chemical Industry and the New York sections of the American Chemical Society and the American Institute of Chemical Engineers.

At this meeting, Col. Dewey was awarded the annual Chemical Industry Medal in recognition of his work in colloid chemistry, especially pertaining to rubber, and for his accomplishments in the government's synthetic rubber production program.

In accepting the Chemical Industry Medal, Col. Dewey spoke on the role of organized research and business in American national defense.

"How was it possible," he asked, "for this peace-loving nation to leap from a standing start into a global war and to surpass quickly in both volume and quality the material of war which our dictator enemies had spent years in scheming, planning and producing? It was possible, I think, because American free enterprise in time of peace had given us for the time of war the needed teamwork of scientists and technical men and business men which was able to work the miracles of large scale."

Col. Dewey, speaking of the synthetic rubber program, gave credit to the work of government agencies, the Baruch Committee and the experts of the Office of the Rubber Director, all of which, he

said, had made valuable contributions.

"But, when all is said and done," he continued, "the actual work—the job itself—was done by the research chemists and chemical engineers, the mechanical engineers, the construction and production men of industry."

Most of these men were working in teams in the laboratories and organizations of large units of American business, he said.

"I emphasize that the big job," he said, "was done by men with background and experience gained on their jobs with big chemical companies, big rubber companies, big oil companies and big engineering and construction companies."

"Thanks to the American competitive system, we had men of resource and intellectual daring, trained and fitted to cope with the new and ever-changing problems of war. We had men out of laboratories and offices accustomed to facing real problems realistically."

We who know the part that business men, scientists and engineers have played in this technological war must see that the lessons are not forgotten, he declared; "the government itself must in the future accept the full responsibility for seeing to it that our vitally needed young technical men . . . remain where they are most needed, on the industrial and research fronts."

Dr. Vannevar Bush, president of the Carnegie Institution of Washington, preceded the medalist on the program and presented some of the scientific and technical accomplishments of Col. Dewey. Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, spoke on the medalist's part in educational matters.

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AGRICULTURE

Buy Cotton by Variety, Is Advice of Experts

► THE VARIETY of cotton is important in buying cotton for specific uses, as the spinning value depends mainly on the crop variety, U. S. Department of Agriculture experts report. The spinning quality and strength of the yarn are likely to be about the same, irrespective of weather. Dry weather, which shortens the fibers, usually makes them stronger.

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MILITARY SCIENCE

More Facts About V-2

Unlike the V-1 it is a true rocket, of the type known to designers and engineers as a spinner; it carries enough fuel for about seven to nine minutes of flight.

► AMERICAN ROCKET experts agree that the V-2 is still in an experimental and developmental state. At present the V-2 penetrates as much as 30 feet into the soil when it hits, leaving the tail sticking up about 20 feet like the end of a telephone pole. This limits the area of the blast, causing only a local earthquake.

Unlike the V-1, the stratosphere V-2 is a true rocket, of the type known to designers and engineers as a spinner. It carries enough fuel for about seven to nine minutes of flight, using about a ton of fuel a minute, and enough bottled gas, either compressed air or possibly compressed nitrogen, to force the fuel into the nozzle where the hot gases that thrust the rocket up 60 miles into the air are formed. These gases leave the combustion chamber through a series of special jets which form a ring on the back plate of the rocket. The jets are bored into the back plate at an angle of about 45 degrees, so that when the flaming gases rush out into the air they cause it to spin and literally chew its way through the air as a screw bites into a piece of wood. This spinning motion stabilizes the rocket in flight, so that it needs no fins. Some British rocket authorities believe that the V-2 has a gyroscopic or servo-stabilizer. On most spinner rockets such mechanical devices are not necessary, though Nazi engineers may have found that the V-2 works better with them than without.

The various reports that have been received estimating the speed of the V-2 up to 3,500 miles an hour, are almost certainly exaggerated. At speeds of 3,500 miles an hour the V-2, like a falling meteorite, would probably destroy itself in space from the intense heat that friction of air on the metal jacket produces. Even at 1,000 miles an hour (300 miles an hour faster than sound) some sort of cooling device would be necessary to prevent it from getting so hot that it would detonate its explosive warhead long before it reaches the earth. This cooling device may resemble the equipment used on high-speed liquid-cooled aviation engines, that is, a coolant liquid circulated by a pump through a jacket around the

one-ton warhead containing the explosive.

Since the V-2 strikes the earth with the terrific speed of 700 miles an hour, more than one detonator seems likely, as well as a time fuse. This system of multiple detonators practically eliminates the possibility of duds. Few, if any, of the stratosphere rockets reaching England have been duds.

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CHEMISTRY

Chemical Method for De-Salting Sea Water

► A CHEMICAL method for getting salt and other dissolved minerals out of sea water, leaving it fit to drink, is among

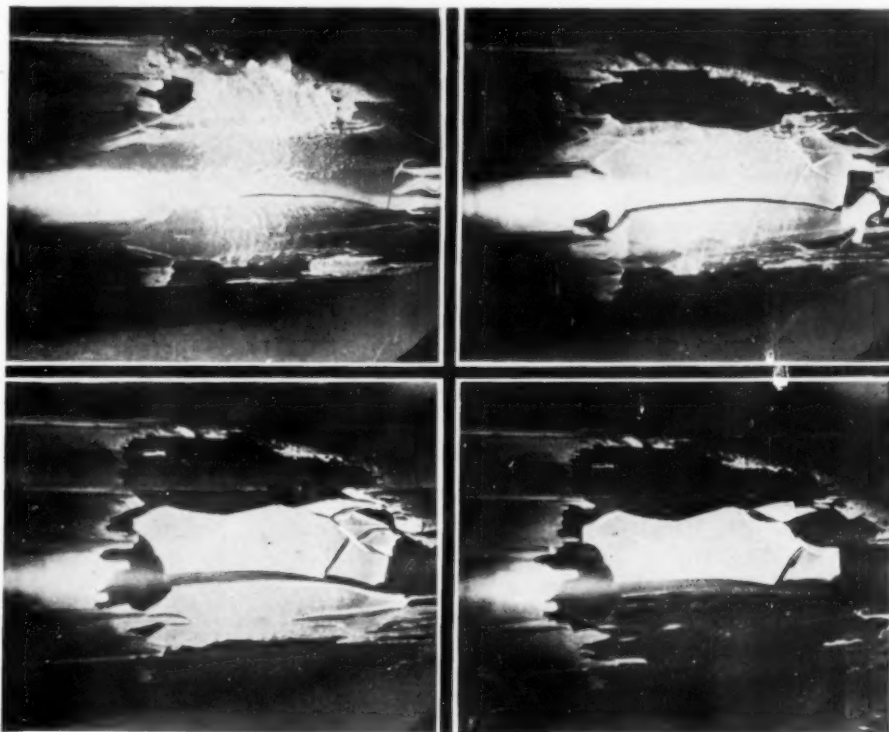
the 511 new U. S. patents issued last week. It was developed by Lt. C. R. Spealman of the Navy's medical research center at Bethesda, Md. Rights on the patent, No. 2,363,020, are assigned royalty-free to the government.

The injurious concentrations of minerals in the sea water are reduced to harmlessness by first adding basic silver oxide. This takes out the chlorine atoms in the form of insoluble silver chloride; at the same time the calcium and magnesium precipitate out as insoluble carbonates.

Sodium, the other half of common salt, presents the greater chemical difficulty, since most compounds of sodium are water-soluble. However, some organic sodium compounds are not; and by adding uric acid after the silver oxide has had time to act, the sodium is brought down also as an insoluble precipitate.

Use of this method, Lt. Spealman states, should make it possible to dispense with the bulky, weight-adding kegs of water hitherto necessary in all lifeboats.

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TWO-WAY STRETCH—This four-picture sequence shows stages in the breaking up and whisking away of ice on a section of airplane wing protected by the new "Type 11" De-Icer, developed by the B. F. Goodrich Co. In the upper left photo, the crack in the middle of the leading edge is hardly perceptible. A few seconds later (upper right), a big top section has blown away and the main surface shows several new fissures. At lower left, the central crack has widened markedly, and an instant later (lower right), the whole bottom half of the encrustation has been whisked away.

NUTRITION-PUBLIC HEALTH

Invention Opportunities

Speedy production of huge quantities of fried eggs and hot cakes and a gadget for automatically preparing grapefruit, are urgently needed by the Army.

► **AUTOMATIC** hot cake, egg frying and grapefruit-preparing machines are invention opportunities in order that great numbers of men in war can be fed quickly.

Lieut. Comdr. C. M. McCay of the Naval Medical Research Institute at Bethesda, Md., in predicting to the meeting of the American Public Health Association, changes in American eating habits, explained that there is need for:

A simple, inexpensive machine to turn out 15,000 to 20,000 hot cakes in an hour; a machine to turn out speedily similar numbers of fried eggs; a simple gadget for automatically preparing thousands of grapefruit so men can eat them with blunt spoons.

Changes in American eating habits and tastes with consequent changes in design of cooking equipment for home and public kitchens as a result of the war are foreseen by Comdr. McCay.

Comdr. McCay reported nutrition studies of mass feeding at naval stations where as many as 7,500 men are fed at a single meal.

The typical man eats a little less than two slices of bread per meal, he found, but bread is still an important fraction of the total food. More might be eaten if more varieties were used and more attractive spreads provided.

Candy bars play an important part in the feeding of the men, he discovered. The typical man in Navy training, unless closely supervised, leaves 400 to 600 calories of food on his tray to go into the garbage and then buys an equal amount, chiefly in the form of candy bars and soft drinks, at the ship's service to satisfy the needs of his body. Candy bars account for about 40% of the food eaten outside the mess hall. Estimated purchase of them for the Army the first quarter of the year was about 100,000,000 per month.

The men tend to reject fats served in their meals. Studies of the deterioration of fats used in deep fat frying are needed, Comdr. McCay found. Simple tests are also needed to tell the cook when it is time to discard cooking fats.

If the men do not like fats, they do like milk. Watching 5,000 colored re-

cruits passing down a cafeteria line, Comdr. McCay saw that not one of several hundred refused milk.

"One can only wonder about the future expansion of the dairy industry," he commented, pointing out also that about 11,000,000 men are learning to eat a balanced diet in the armed forces and that they will have a tremendous influence on our eating habits in a decade or so when they become the heads of families of 40,000,000 to 50,000,000.

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Navy Uses Ultraviolet

► **RESPIRATORY** illness, such as bad colds with fever, German measles, scarlet fever and the like, was reduced one fourth by ultraviolet irradiation of dormitories at the U. S. Naval Training Center, Sampson, N. Y., during the winter of 1943-1944, it was announced at the meeting.

Germ-killing ultraviolet light has previously been used to check the spread of disease in hospital wards and school rooms and to sterilize the air about the patient in operating rooms. This however was its first test in military barracks. The test was made by a six-man team of U. S. Navy disease fighters, Lieut. S. M. Wheeler, Lieut. Hollis S. Ingraham, Dr. Alexander Hollaender, Lieut. Comdr. Nicholas D. Lill, Lieut. Comdr. Jacob Gershon-Cohen and Capt. E. W. Brown.

The 25% reduction in respiratory illness was achieved in those barracks equipped with high intensity sources of ultraviolet energy. Other barracks without the ultraviolet irradiation served as controls.

In the irradiated barracks, lamps were hung from the ceilings of dormitories and were installed under every other bunk. These last had their ultraviolet rays directed downward to strike at germs on the floor and in the dust. Only sleeping quarters were irradiated. Drill halls, mess halls and the like were not.

The visible light from the powerful lamps was too low to interfere with sleeping and the men found it similar to bright moonlight. Practically none

complained of any harmful effects on the eyes. The effect of the ultraviolet in checking disease was most marked in the early winter months when illness rates were at a generally high level throughout the camp. At this time reduction of illness in the irradiated barracks over the non-irradiated was over 35%.

Illness due to streptococci such as scarlet fever and strep sore throats, and healthy carriers of these germs were at a very low level in the camp and were not further reduced among men living in the irradiated barracks. Samples of the air showed only half as many germs of all kinds in the irradiated quarters as in the non-irradiated. Because the reduction of sickness rates was marked only during the first months of the test, the Navy scientists say the result "should be interpreted with caution." Further tests, planned for this winter, may tell the story of how effective ultra-violet light can be in checking disease in barracks.

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Health Supervision

► **MANY** of the physical and mental defects which disqualified several million American young men for military service could have been prevented by continuous health supervision, including mental hygiene guidance, throughout the school years, Dr. Henry F. Mace of the New York State Education Department, told members at the meeting.

"The rate of rejection of boys who have been under the school health program until they reached 18 was very much less than the general average," he found. "Boys who had the benefits of the school medical service were in much better condition than those who had not."

Physical education training has much less to do with rejections than has usually been thought, it appears from a study of six high school graduating classes made by the superintendent of schools in one city.

From the classes of 1939 to 1942 whose physical education facilities were limited, this superintendent found, 93% of the 18-year-olds were accepted by the fighting services. Of the two classes of 1943 and 1944 who had much better physical education facilities, however, only 86% were accepted.

Analyzing the results of 15,000 examinations in New York State Selective Service Dr. Mace found the 18-19-20 year olds showing a much lower rate of defects than the older age groups.

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NUTRITION

Vitamin Notion Debunked

The idea that normal, healthy people acquire more "pep" and energy and gain weight by taking vitamin pills or supplements not borne out.

► THE IDEA that apparently normal, healthy persons eating the usual American diet would acquire better appetites and more "pep" and energy and gain weight by taking vitamin pills or supplements is debunked in a report by Dr. Julian M. Ruffin and Dr. David Cayer, of Duke University (*Journal, American Medical Association*, Nov. 25).

Their study was conducted at the request of the Office of the Quartermaster General, U. S. Army. It was made on a group of 200 volunteer medical students and technicians. These were divided into five groups. For a period of 30 days, one group took G. I. vitamin tablets and liver extract tablets, another yeast extract tablets and the vitamin pills, a third the vitamin pills and a sugar pill made to look just like the others, a fourth vitamin pills only, and the fifth the sugar pills only.

The test was run for 30 days because that period is found sufficient for recovery under vitamin treatment of patients frankly sick from lack of vitamins.

None of the volunteers knew what was in the pills they were taking. Each kept a daily record of weight, his impressions of any effect on appetite, "pep" and energy, and of such symptoms as "gas" or indigestion, nausea and vomiting, abdominal pain and diarrhea.

"A significant increase in diarrhea and a highly significant increase in abdominal pain and in nausea and vomiting occurred in those groups receiving liver extract and yeast," the physicians report.

"No significant increase was noted in appetite, energy and 'pep,' 'gas' and indigestion, general health or weight among the various groups."

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PSYCHOLOGY

Facts on Disputed Book

Claims made in the controversial *Races of Mankind* are substantially correct but do not tell the whole story, it is indicated.

► CLAIMS MADE in the controversial book *Races of Mankind*, which the Army withheld from sending to men overseas, are substantially correct but do not tell the whole story, a report to the *Journal of Abnormal and Social Psychology* by Dr. Thelma G. Alper and Prof. Edwin G. Boring of Harvard University indicates.

Prof. Boring is author of the original 1919 report of intelligence scores of the First World War draft from which the authors of *Races of Mankind* took the figures indicating superiority of northern Negroes to southern whites that stirred so much adverse criticism. He was then a captain in the Army.

Dr. Ruth Benedict and Dr. Gene Weltfish did base their assertion on results from only a few states, these psychologists find, and they strengthened their case by omitting the northern state in

which Negroes averaged lowest and the southern state in which the whites averaged highest.

"That was fair enough," the psychologists comment, however, "since they wanted to show that the difference usually found can be reversed when extreme instances are selected."

Here are the figures when all states and both the Alpha and Beta (for illiterates and non-English-speaking persons) examinations are included. The figures are "not wholly unlike mental ages."

Southern Negro 9.8; southern white 12.7; northern Negro 12.0; northern white 14.1.

Including the Beta scores did not give any advantage to the Negroes, Prof. Boring and Dr. Alper state. Although this test required no knowledge of reading and writing and even the directions for taking the test were given by gesture



OUTDOOR SPOTWELDING—

It is now possible to weld airplane engines on the spot, saving valuable hours. A portable spotwelder was assembled at the Glenn L. Martin Co. to do this job.

rather than words, high scores on it apparently required a good deal of sophistication. While including Beta scores in the average helps the Negro average, it raises that of the white more.

"It was a disadvantage in the Army tests of 1918," the investigators conclude, "for a white or a Negro to come from a southern state where education and economic opportunities are few instead of from a northern state where they are better, and also a disadvantage, whether northern or southern, to be Negro and not white. Thus the average score for the southern Negroes is lowest of the four because southern Negroes work against both disadvantages, and the average score for the northern whites is, conversely, highest of all. Benedict and Weltfish might have avoided the criticism of selection of states had they given all four of these averages instead of only two, for then they would have avoided the false implication that skin color made no difference in the states under consideration."

The Army psychologists of 1919, the report points out, were not ready to draw any conclusions at all about the relative intelligence of the recruits from different states—there were too many unknown factors operating in the selection of the men tested.

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MEDICINE

Hope Fades for Penicillin As Arthritis Remedy

► THE HOPE that "many physicians and a host of rheumatic patients" have had that penicillin would prove an effective remedy for rheumatoid arthritis is dispelled by a report from Maj. Edward W. Boland, Capt. Nathan E. Headley and Lieut. Col. Philip S. Hench, of the Army Medical Corps (*Journal, American Medical Association*, Nov. 25).

These officers gave large doses of penicillin to 10 soldiers with arthritis at the Rheumatism Center of the Army, Army and Navy General Hospital, Hot Springs, Ark.

The results of the treatment were "essentially negative," they report. In seven of the 10 cases, there was no improvement that either physician or patient could detect. One patient felt worse but did not seem to be in worse condition than before treatment. Another patient thought he was better but the doctors could find no signs of improvement. In one other patient there was moderate improvement, noted by patient and physician, in some but not all of his rheumatic joints. The doctors do not believe this was related to the penicillin, since rheumatoid arthritis is a "capricious" disease, with occasional periods when the patient seems better, no matter what kind of treatment he may be getting.

The results of this trial of penicillin also seem to show that rheumatoid arthritis "is not caused by any of the bacteria known to be rapidly affected by penicillin," the medical officers point out. This includes the hemolytic streptococci which have been most under suspicion in recent years.

In the trials, the doses of penicillin given each patient were known to be enough and perhaps more than enough to affect severe infections with streptococci, staphylococci and other germs.

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PUBLIC HEALTH

Watch for Malaria On Return from Tropics

► MANY CIVILIANS as well as men in the armed services have been exposed to malaria in the course of construction or other jobs in tropical areas during the war. They should be alert to the possibility of developing an attack of malaria within a few days or weeks after their return home. Any sign of sickness, even if it appears to be only a cold, should be

the signal to these persons to consult a doctor at once. The patient, or a relative if the patient is confused as may be the case in some forms of malaria, should tell the doctor that the patient has been in a tropical area so the doctor will be alerted to the possibility of the illness being malaria and will examine the patient's blood.

Three cases, two of them fatal, in which the malaria attack masqueraded as a cold or gripe, and others in which stomach and intestinal symptoms were misleading, were reported by Dr. Harry Most and Dr. Henry E. Meleney, of New York University College of Medicine (*Journal, American Medical Association*).

In one case the man returning to America from Africa by airplane had a chill on his arrival at Miami, but continued his trip to New York. Two days later he consulted a physician for what seemed to be a cold. His temperature was normal and he was given treatment to relieve the cold symptoms. The next day he had a severe chill and could not recognize his wife. He was taken to the hospital and the illness diagnosed as malaria the following day. Intensive quinine treatment was started but it was too late to save him and he died eight days after his first chill.

When a falciparum malaria attack starts with symptoms of a stomach or intestinal upset, with pain, nausea, vomiting and diarrhea, conditions requiring an operation such as intestinal obstruction may be suspected. If it is known that the patient has been in the tropics, such symptoms, especially the diarrhea, are particularly misleading because they suggest bacillary or amebic dysentery. First step in such cases, the New York physicians advise, is to examine the blood to see whether or not the patient has malaria.

Science News Letter, December 2, 1944

MILITARY SCIENCE

Carrying Bombs in Wings Helps Streamline Bombers

► AN INVENTION designed to improve the streamlining of dive-bombers is the subject of patent 2,362,345, issued to Edward M. Bertrán of Jackson Heights, N. Y., assignor to the Brewster Aeronautical Corporation. Most dive-bombers mount their bomb racks beneath the wings, but in Mr. Bertrán's design the bombs are contained within the wings, each with its own small bomb-bay doors. Selective releases permit the dropping of any or all of the bombs at the pilot's will.

Science News Letter, December 2, 1944

IN SCIENCE

BIOCHEMISTRY

Hormones Sprayed on Plants Retard Bud Development

► THE CHEMISTRY of living plants is concerned in patent 2,363,325, granted to Dr. A. E. Hitchcock and Dr. P. W. Zimmerman of the Boyce Thompson Institute for Plant Research at Yonkers, N. Y. They have found a surprisingly long-enduring effect in retarding bud development in plants sprayed with "delay-action" hormones such as alpha-naphthaleneacetic acid and some of its chemical relatives. Sprays applied during the summer, before the buds have become dormant, will cause a delay of a couple of weeks or more in their unfolding during the following spring. Useful applications of this discovery are in the holding back of flowering and fruit formation until after frost danger is over, and the checking of undesired foliage growth when shrubs and trees have to be transplanted late in the season.

Rights in the patent are assigned to the Boyce Thompson Institute.

Science News Letter, December 2, 1944

AERONAUTICS

Daniel Guggenheim Medal Awarded to Lawrence Bell

► THE DANIEL GUGGENHEIM medal has been awarded to Lawrence D. Bell of the Bell Aircraft Corporation for achievement in aeronautics, particularly for achievement in the design and construction of military aircraft, and for outstanding contributions to the methods of production.

Mr. Bell is one of the few aeronautical pioneers still actively engaged in the industry. Since early life he has been in aircraft development work, becoming, after years of service, general manager of the Glenn L. Martin Company and later general manager of the Consolidated Aircraft Corporation. He organized his own company seven years later and since then has specialized in fighter planes.

The award is made by a committee appointed by the American Society of Mechanical Engineers, Society of Automotive Engineers, and the Institute of the Aeronautical Sciences.

Science News Letter, December 2, 1944

NE FIELDS

ORDNANCE

Bearings for Torpedoes Given Exacting Tests

► **TINY BALL BEARINGS** used in torpedo gyros that stabilize the expensive torpedoes and direct them accurately toward enemy targets are given exacting tests before they are put into service.

The bearings are first inspected by an electronic device that determines if they are out of round more than six millionths of an inch. A millionth of an inch is about the thickness of the layer of moisture left by your finger on the blade of a silver table knife when you touch it.

Next, the bearings receive microscopic examination to detect surface scratches and pitting which may affect the accuracy of the torpedo in action.

Finally, the balls are rolled over a 24-inch strip of plate glass to determine whether or not they will run true. The glass is tilted at an angle of five degrees and coated with a fine oil film. The balls are placed one by one at a point on the high end of the slab and roll slowly over the oil film to a point at the low end exactly opposite the point where they were started. If the path of the ball is not straight, it is discarded.

These tests, conducted at the Pontiac torpedo plant, are typical of the exacting accuracy required in the production of many items which go to make up the American war machine.

Science News Letter, December 2, 1944

CHEMISTRY

Jellied Gasoline Resembles Raspberry Gelatin

► **JELLIED** gasoline, food for flamethrowers and fire bombs, looks like raspberry or orange gelatin but is deadly despite its looks. It is made to order at the battlefronts by stirring a secret white powder into ordinary motor fuel.

Developed through a cooperative research program under the direction of the War Department and the Office of Scientific Research and Development, the incendiary material has already proved a potent weapon against the enemy. The jellied gasoline and the two weapons that use it were developed as a result of the serious shortage of magnesium, the white metal formerly used

for incendiaries. The new materials are as effective as the magnesium bomb, and can be produced in mass quantities with readily available materials.

Characteristics of jellied gasoline are that it maintains an intense flame over a period of 8 to 10 minutes and it sticks to its target, igniting any substance that will burn, such as wood or cloth, at temperatures as low as 40 degrees below zero Fahrenheit.

Buildings and machinery shattered by explosives are often rebuilt, but those razed by fire are frequently destroyed beyond repair and are therefore abandoned. For this reason Army Air Force bombers have increased the proportion of incendiaries carried on each operation until today some operations carry up to 50% jellied gasoline oil bombs.

Flamethrowers spit streams of the jellied gasoline into enemy fortifications, such as pillboxes, and into moving tanks. The range of these powerful blowtorches is so long that operators can shoot flames from beyond the practical range of enemy small arms.

Science News Letter, December 2, 1944

CHEMISTRY

Treated by New Process, Tin Cans Resist Rusting

► **TIN CANS** resist rusting in outdoor exposure in hot humid weather when treated by a new process developed at the Battelle Institute in Columbus, Ohio. The process is the result of research in the United States and in England to develop full protection for food for fighting men in parts of the world where ordinary treatment is not sufficient.

In the new method, after the cans are filled, sealed and processed, they are dipped momentarily into a hot solution of alkaline salts. This cleans the surface and produces an invisible film over the tin. No lacquer or enamel is used on the cans, as in present protective processes.

Lacquering tin plate to prevent rusting involves expensive and inconvenient operations in the manufacture of cans, it is explained. The hot alkaline process is readily adaptable to production lines in canneries. Protection against corrosion may not be quite as good as lacquers under some conditions, but it appears to be adequate for most purposes.

The mechanism of the new process is not definitely understood as yet. However, tests show that pinhole corrosion is effectively delayed and the cans stay bright and clean after weeks of outdoor exposure.

Science News Letter, December 2, 1944

WILDLIFE

Pheasants Scatter Seeds Of Own Food Plants

► **ADVANTAGE** should be taken of the pheasants' capacity to disseminate seeds of food plants in places they frequent in order to reduce the amount of planting needed to establish adequate food and cover for the birds, Wendell G. Swank of the University of West Virginia suggests.

Seeds that have passed through the digestive tract of the pheasant sprout more quickly than ordinary seeds, the author stated, because they have been worn down by abrasive action in the digestive tract. In the case of poison sumac, 70% of the seeds found in an unbroken condition in bird droppings germinated whereas only 20% of the untreated seeds grew.

Ring-necked pheasants distribute the hard-coated seeds of plants such as grape, Virginia creeper, black locust, poison sumac and many others in a good condition for growing. Of the seeds of this kind eaten by pheasants, approximately 6% are passed through the digestive tract in a viable condition, Mr. Swank reports. (*Journal, Wildlife Management*). These are dropped in locations frequented by the birds and, if germinating conditions are favorable, valuable food and cover plants are thus disseminated.

Seeds for food plot mixtures should include some easily digested seeds, but also others that are not. By planting a few hard-seeded perennials in spots where pheasants will find and utilize them, the seeds might easily be scattered abroad, Mr. Swank stated.

Science News Letter, December 2, 1944

CHEMISTRY

High-Temperature Method Removes Iron from Tin

► **A DIFFICULT** means of chemical separation, important in the present emergency, is covered by patent 2,363,127, obtained by R. H. Graves of Westfield, N. H. It is on a method for removing iron from tin during the smelting process; the commoner metal can be a troublesome impurity in tin during its metallurgical handling. The inventor states that he has found that at temperatures higher than those commonly used—925 to 1472 degrees Fahrenheit—a dross of tin-iron compounds is formed on the molten metal. If this is skimmed off, the remaining tin is left pure.

Science News Letter, December 2, 1944

ZOOLOGY

Soldiers' Pets

Many problems face service men bringing pets into the U.S.A., but in spite of this, many monkeys, coatis and kinkajous will come home with them.

By FRANK THONE

See Front Cover

► WHEN JOEY COMES marching home again, he'll be very likely to have a monkey roosting on his shoulder, or some even more exotic creature like a coati or a kinkajou. For young Americans are just as prone to acquire pets and mascots as they are to pick up souvenirs. The cockatoos seen on the front cover of this SCIENCE NEWS LETTER were sent from the Solomons by Maj. Gen. R. G. Breene, U.S.A. The photograph is by Fremont Davis, Science Service staff photographer. (See SNL, Nov. 18, p. 328.)

It isn't possible to wrap up an agouti or an anteater and ship it home as you might a pair of Zeiss binoculars or a Samurai sword, but despite all kinds of difficulty in care and feeding, thousands of service men are nursing all manner of strange beasts and birds, culled from the faunas of outlandish places from Iceland to New Caledonia.

One can almost hear already the frantic feminine protest: "But what on earth are we going to do with the thing?" as patient mothers are confronted with an exaggerated form of the stray-dog problem, or young wives try to adjust to the idea of a queer-looking creature in fur or feathers (or even scales!) as an extra lodger in the apartment.

Monkeys Are Appealing

In many cases, adjustment will be made readily enough. Most people find monkeys interesting and appealing, especially the smaller kinds. Marmosets and other "lapdog-size" members of the monkey family are usually gentle enough to be given the run of the place. Some of the other monkeys not too large to be house pets, like the spider monkey and the common rhesus or organ-grinder's monkey, may get into trouble through their inquisitiveness and incessant activity and may therefore have to be given a perch and chain or put in a cage.

A pet that may be brought back from tropical American lands where some of

our troops are stationed is the coati-mundi, often called simply coati, a long-nosed, long-tailed relative of the raccoon. Less acrobatic than the monkeys, the coati is nevertheless a good climber and can make surprisingly long leaps. Coati is readily tameable and becomes very affectionate. Like his cousin, the raccoon, he is exceedingly inquisitive. Also like the raccoon, he is peaceable in disposition, but still able to make the average dog regret his rashness if he bothers him.

Some soldiers' pets that have already arrived in this country from the South Pacific and Indian Ocean regions are among the strangest and most baffling of all evolutionary riddles. They are usually classified with the monkeys and apes (and ourselves), but are placed at the bottom of primate society.

Known by such names as lemurs,

tarsiers and phalangers, they are small, timid creatures, neither as active nor as intelligent as monkeys. They are mostly nocturnal in their habits, and have big eyes adapted for seeing in dim light. They are very interesting zoological curiosities, but on the whole are not lively enough to be satisfactory pets. Besides, they are difficult to feed properly.

Can't Bring Koalas

A pet which every member of the Armed Forces who gets to Australia would like to bring back is the koala, or native bear. Actually, it is not at all related to the bears, being a marsupial like the wallabies and wombats and most of the other mammals of that strange continent. But they look so much like cuddly live Teddy-bears that the name is inevitable.

They can't be brought home for two sufficient reasons. First, the Australians wouldn't let you. Like ourselves, the Australians for a long time thoughtlessly exploited their wildlife, and during those years of waste killed nearly all of their



FOREIGN FRIEND—It is easy for soldiers to get acquainted with such appealing animals as this monkey.



TEDDY-BEARS—These tiny koalas are very friendly, but cannot be taken out of their native Australia.

koalas for their fur. Now they are jealously conserving the remnant.

Even if you were permitted to take a koala out of its home country, it would almost certainly die on the way. Koalas feed only on the leaves of one kind of eucalyptus tree, and will starve in the presence of other kinds of food, no matter how abundant. So it's just no use trying.

Feeding a Problem

That problem of feeding is going to be a serious snag in the keeping of many kinds of pets from lands far overseas. If you had the nerve to bring in a young lion or leopard, where would you get meat enough for its growing appetite? Anteaters are fun, when you have them in the tropics where there are plenty of insects, but they are hard to provide for in our carefully debugged houses. Unfortunately, they cannot be trained to go after the termites in the woodwork.

Because of these and similar difficulties in pet rations, many service men's pets that have already been brought home have soon found their ways to zoological parks. Experienced keepers there, with better facilities, can take good care of animals that in the average household eventually starve or sicken.

One thing that many service men over-

seas may not always know (although efforts have been made to keep them informed), is that to bring any kind of animal into the United States he must have a formal permit, issued through the Fish and Wildlife Service. His pet must be scientifically inspected before it can enter. This is required partly to prevent, if possible, the introduction of any more pests like the English sparrow and the starling, partly to make sure that sick animals and disease-germ carriers get no chance to spread epidemics among domestic animals already here.

There is a fairly long list of mammals and birds that ordinarily may not be admitted at all. At its top are parrots and all their kin, such as cockatoos, macaws and lovebirds. They may be carriers of psittacosis or parrot fever, a deadly malady that raised a lot of trouble in this country some years ago. Most other suspected disease-carriers are kept out primarily because of possible danger to other animals, rather than to human beings.

Excluded as possible pests in themselves are the weasel-like mongoose, the crested Chinese mynah (an Asiatic starling), European hare and rabbit, and a number of species of rodents. So if G. I. Joe has made friends with any of these undesirable foreigners he will have to

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Do You Know?

Electric household *clocks* are not yet 30 years old.

Doves often complete *three broods* during one season.

Salt is the most common mineral in existence and one of the most useful.

Japanese beetles are not usually severe agricultural pests in Japan because they are kept in control by natural enemies.

Excellent protection against *chiggers* is secured by an application of a mixture of dimethyl phthalate and indalone inside the legs of trousers.

Rotting apples under fruit trees should be picked up and removed or they may hold over for the next season diseases that might affect the new crop.

The Chinese *alligator*, a species of crocodile that lives in a small area near Shanghai, may not survive the war as both Japanese and Chinese soldiers have fought back and forth over the area and killed many of them.

Lactic acid, which gives the flavor to many soft drinks, is now under government allocation because it has war uses; it is employed in cleaning, sterilizing and processing textiles, in leather tanning and in lactates used in plastics.

bid them adieu before starting on his homeward voyage.

Permits to bring in pet animals are obtained by addressing the U. S. Fish and Wildlife Service, Chicago, Ill. This is best done in advance, if date and port of probable arrival are known. Since this information is often not available, application may be made while en route, by cable or radio. The Service clears all applications as promptly as is humanly possible, and often has its volunteer inspectors waiting at the dock when the ship lands.

Science News Letter, December 2, 1944

PUBLIC HEALTH

Germ-Killing Soap Lowers Chances of Infection

► **CLEANER** hands and skin, with far fewer germs so that the chances of infection in cuts, scratches and blisters will be much less, is the postwar promise of a new germ-killing soap reported by Dr. Eugene F. Traub, of New York, and Dr. Chester A. Newhall and John R. Fuller, of the University of Vermont (*Surgery, Gynecology and Obstetrics*).

The soap will have in it a synthetic phenol, dihydroxyhexachloro diphenyl methane, known for short as G-11. Due to wartime restrictions, soap containing this germ-killing chemical cannot be made available at present except for experimental purposes or clinical trial.

In one of the tests reported, soap containing 2% of G-11 was used for all purposes from hand washing to dishwashing for a period of one week. The persons in the tests then washed their hands and forearms for 75 seconds in a good lather of ordinary toilet soap followed by a 20-second rinse. Samples of the soapy water had only about 250,000 germ colonies compared to about 3,250,000 in the same-sized sample of soapy wash water from persons who had used ordinary toilet soap for a week.

Included in the group using the G-11 soap for one week was a football player. He came straight from practice for the final soap washings. In spite of the dirt on his hands, and contrary to what the scientists expected because of the grimy state of his hands, the soap and water he washed in gave a count of only 290,000 germ colonies, only slightly higher than the average.

A person who uses G-11 soap regularly, the scientists state, has fewer "resident" germs on his skin after two minutes of washing than a person who washes for 20 minutes with ordinary toilet soap. Previous studies by other

scientists have shown that some of the germs on the skin are transients that can be easily washed off with soap and water but that others are in the nature of permanent residents and resist removal.

Daily use of a toilet soap containing G-11, it is suggested, would enable a surgeon or operating room attendant to keep these resident germs down to an extremely low level. The routine scrubbing before operations might be shortened and irritating germicides might be eliminated without sacrificing any surgical cleanliness. Omission of the alcohol and iodine rinse might be an important economy now, when these chemicals are not readily available.

While civilians at home may not be able to get any G-11 soap for the duration, members of the armed forces might get some benefit if front-line surgeons and their assistants are able to get it, the scientists suggest. Its use would keep germs on their hands to a minimum so that, even though lengthy surgical scrub-up procedures with alcohol and iodine rinses might be impossible, there would be less likelihood of the soldier's wound being contaminated by those dressing it.

G-11 has the advantage of not being irritating to the skin.

Science News Letter, December 2, 1944



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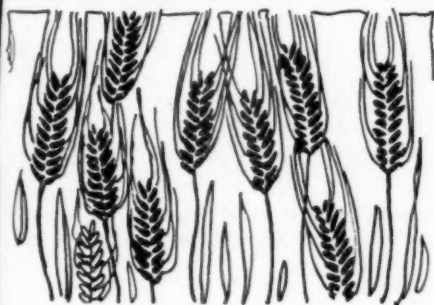
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AGRICULTURE

NATURE RAMBLINGS

by Frank Thone



Bread From Snow

► A LARGE SHARE of our wheat crop, and smaller proportions of other small grains, are fall-sown. The seed germinates soon after sowing and the young grain usually makes a good growth before cold weather arrives to check it. Then it stands, with its life-fires banked, until returning warmth in spring gives it leave to grow again.

Highly important, during these months of suspended activity, is the protection afforded by a good blanket of snow. Farmers feel at ease if they cannot see their wheat from December until March; if the green becomes visible through the white they begin to worry.

Snow benefits winter grain in several ways. For one thing, although the white blanket does not keep things under it really warm, in terms of human comfort, it does maintain a somewhat higher temperature than that of the outer air. And what is perhaps of even greater importance, it prevents wide and rapid temperature swings such as take place outside.

The common figure of speech that likens snow to a blanket is really quite apt, despite its triteness. Snow influences temperature exactly as a good woolen blanket does: it interposes a mass of small, imprisoned air spaces between the object which it shelters and the cold of the outer air into which heat would otherwise be lost by radiation. When snow is partly converted into ice by thawing and re-freezing it loses much of this insulating value—a glazed field is a field in danger.

Another useful function of snow cover is the protection it gives against evaporation. The atmosphere within a snowbank

is very humid, so that the covered plants have little demand made upon their water content—precious because irreplaceable so long as the soil remains frozen and the roots are out of action.

While snow is over the ground, the restless "heaving" that comes when soil is alternately thawed and frozen is suppressed. When heaving takes place in an uncovered field, the exposed wheat plants are likely to have their roots torn

off, and are often turned upside down into the bargain.

The final benefaction of a good snow cover comes with the spring thaw. Most of the snow water sinks slowly into the soil right where it is, becoming immediately available for the needs of the newly thirsty, rapidly grown plants. The abundance of July's harvest is thus largely determined in January.

Science News Letter, December 2, 1944

A prism a minute
for men of the hour...

Greatly accelerated production of optical parts—with no deviation from Bausch & Lomb exacting standards of precision manufacture—is contributing much to the uninterrupted supply of binocular prisms, for example. Advanced techniques, developed by Bausch & Lomb long before the war, make possible a prism a minute every working minute of the day.

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PSYCHIATRY

Clinics Needed

Every veteran who wants to see a psychiatrist upon discharge should have an opportunity of getting this professional help, physician urges.

► EVERY veteran who wishes to see a psychiatrist upon discharge ought to have the opportunity. This statement is made by Dr. Temple Burling, of the Providence Child Guidance Clinic, (*American Journal of Orthopsychiatry*, October). Dr. Burling urged that communities set up a clinic with workers lent by local agencies or in some other way prepare to meet the problem of returning service men discharged for neuropsychiatric reasons. His advice is based on six months experience in advising veterans of this war.

The psychiatric needs of these young men are not very acute, he said. If they get some breaks, they stand an excellent chance of being restored promptly to the condition they were in before induction.

But the worst thing that could happen to them, he indicated, would be to put them in a hospital. The next worst thing would be a long-term financial settlement. They may need some financial help in tiding them over until they are established, but what they need most is help in getting well and becoming established in a job.

"The job problem is an acute one," Dr. Burling pointed out. "At the time of re-

turn to the community some veterans are wholly unable to work, all are quite limited in vocational capacities, and probably unable to return immediately to their accustomed work. It is important that they learn by actual experience that they are employable, at least to a limited degree.

"It is the combination of waiting for a claim (from the Veterans Administration) and finding oneself unable to work, or making unsuccessful attempts to hold down a job, which undermines the determination of the young men to get back into normal civilian life."

Successful job experience, he explained, goes a long way toward clearing up the symptoms of a man discharged for neuropsychiatric reasons.

The first thing a community clinic should furnish for veterans is a thorough physical examination. They have had, to be sure, a thorough going-over in the Army, but it has been so impersonal that many remain unconvinced of its thoroughness. They may feel that something is wrong with them that the Army doctors have missed. A new, civilian, examination may help to reassure them.

After the physical examination, the clinic can provide the veteran with psychiatric advice or treatment, vocational guidance and, finally, help in fitting himself back into the everyday, civilian life of the community.

This community care can probably best be given by the community without the aid of the Veterans Administration, Dr. Burling indicated, because the emphasis of legislation has been on money awards rather than on restoring the man to health and self-support. If the Veterans Administration were to provide therapy, the soldier might interpret this as an attempt to whittle down his claim.

Science News Letter, December 2, 1944

METALLURGY

Commercial Standard Set For Diamond Powder or Dust

► DIAMOND POWDER, used by gem cutters in cutting, forming and polishing precious stones, is now standardized according to commercial standards prepared by private industry working under the auspices of the National Bureau of Standards.

The standard, adopted by a recent meeting of manufacturers, covers material, grain size, adulterations and impurities, and other factors of importance to users. Diamond powder or dust is used in many industrial processes, in addition to those mentioned, that play an important part in the making of war equipment.

The new standard includes 14 grade designations which are concerned with the sizes of the particles varying up to 550 microns. (A micron is a thousandth of a millimeter.) In testing, a sample weighing a tenth of a carat is put on a glass slide, moistened with pine oil, placed under a suitable microscope and measured with a micrometer eyepiece.

Approximately two-thirds of the total world production of diamonds by weight and one-fourth by value is consumed in industrial uses and constitute what is known as industrial diamonds. About 45% of the industrial diamonds, by value, are used in drills in mining operations; 30% in diamond-set tools in industries for cutting, grinding and machining metals, and for other similar uses; and some 10% for diamond dies used in drawing fine wire to uniform diameter. Most of the rest is powdered and forms the diamond dust used as an abrasive.

Science News Letter, December 2, 1944



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THE ART OF RESUSCITATION—Pael J. Flagg—*Reinhold*, 453 p., illus., \$5.

THE AVIATION DICTIONARY FOR BOYS AND GIRLS—Leslie E. Neville, ed.—*McGraw*, 192 p., illus., \$2.

CORNELL RED BOOK OF MARINE ENGINEERING, QUESTIONS AND ANSWERS—W. B. Paterson, ed.—*Cornell Maritime*, 492 p., illus., \$3.50.

FUNDAMENTALS OF BACTERIOLOGY—Martin Frobisher—*Saunders*, 826 p., illus., \$4, 3rd ed.

HURRICANES, THEIR NATURE AND HISTORY—Ivan Ray Tannehill—*Princeton Univ. Press*, 268 p., illus., \$3, 5th ed.

INTRODUCTORY AERONAUTICS—Clarence A. Hammond, Jr., and Harry H. Gilbert—*Oxford Book Co.*, 275 p., paper, illus., \$1. (*Oxford Technical Handbooks*.)

ISLAND VICTORY, THE BATTLE OF KWAJALEIN ATOLL—S. L. A. Marshall—*Infantry Journal*, 213 p., paper, illus., 25c.

A MAZE OF AMAZING FACTS—Daniel Sargunas—*Meador*, 204 p., \$2.

THE NATURAL HISTORY AND BEHAVIOR OF THE WESTERN CHIPMUNK AND THE MANTLED GROUND SQUURREL—Kenneth Gordon—*Oregon State College*, 104 p., paper, illus., 75c (*Oregon State Monographs, Studies in Zoology*, No. 5, 1943).

PSYCHOLOGY—Floyd C. Dockeray—*Prentice-Hall, Inc.*, 504 p., illus., \$3.

THE THEORY OF RESONANCE AND ITS APPLICATION TO ORGANIC CHEMISTRY—George Willard Wheland—*Wiley*, 316 p., illus., \$4.50.

THE VELOCITY OF LIGHT—N. Ernest Dorsey—*Am. Philosophical Soc.*, 110 p., paper, illus., \$2.25 (*Transactions*, new series, vol. 34, pt. 1).

Science News Letter, December 2, 1944

METALLURGY

Tablet Manganese Prepared With No Melting Necessary

► SEVERAL metallurgical inventions of interest figure among recently issued patents. One is on a method of preparing manganese in tablet form without melting it. It is covered by patent 2,361,925, obtained by H. A. Bassert of Washington, Conn., and J. C. Hartley of Norwalk, Conn., assignors to Minerals and Metals Corporation.

The manganese, freshly reduced from the ore under a non-oxidizing atmosphere, is compressed into tablets which are given an oxygen-excluding coating of ammonium chloride or other suitable chemical. In this state the manganese maintains its maximum value for steel-making purposes until ready for use.

Another interesting patent in the field of metallurgical chemistry is No. 2,362,202, granted to John O. Hay of Cleveland Heights, Ohio, and assigned by him to the Harshaw Chemical Company of Elyria, Ohio. It is a process for recovering copper from alloy scrap containing zinc or other metals. The scrap is immersed in a hot aqueous solution containing sulfides or chlorides and finely divided sulfur. Copper sulfate is formed and precipitated, salts of the other metals remaining in solution.

A third metallurgical process is cov-

ered by patent 2,362,046, issued to F. R. Bonte of Canton, Ohio, assignor to the Timken Roller Bearing Company. It is on an alloy steel containing from 0.5% to 2% of carbon in the form of graphite, with additions of molybdenum, manganese, silicon and titanium.

Science News Letter, December 2, 1944

An airplane gunner knows that his bullets never go where he points his gun; they travel both in the direction of the target and also forward at the same speed as the plane.



Precision Brings Pacific Victories

Aimed with deadly precision, aerial torpedoes have been a decisive factor in Pacific victories.

Early in the war, U. S. Navy Torpedo Squadrons launched their "tin fish" by diving in dangerously close to their target. The risks were great—but they sank plenty of Jap ships.

The problem in this type of attack is to estimate the distance to the target and the speed of the target. He must aim—not where the ship is, but where it will be when the torpedo strikes.

To solve this problem, he uses a Torpedo Director in which an enemy ship can be centered easily and quickly.

The Torpedo Director is one of many scientific instruments being produced by Spencer Lens Company to speed Allied victory.



Spencer LENS COMPANY
BUFFALO, NEW YORK
SCIENTIFIC INSTRUMENT DIVISION OF
AMERICAN OPTICAL COMPANY



• New Machines and Gadgets •

⚙️ **BATTERY-LESS** flashlight, small enough to be easily carried about with one hand, contains an internal combustion engine of the type used in miniature airplanes and a tiny electric generator to light the bulb. A simple mechanism for starting the engine is also included.

Science News Letter, December 2, 1944

⚙️ **AIRCRAFT** spark plugs, with new internally cooled center electrodes, have increased life and dependability. The electrode is composed of a drawn nickel alloy cap into which is fitted a brazed copper core. This affords internal cooling by increased heat conductivity, and also reduces erosion.

Science News Letter, December 2, 1944

⚙️ **REFRIGERATED** package is the term applied to an eight-foot-long metal container for use in bringing fresh food to frontline troops. It has a gasoline-powered cooling unit and twin slabs seven feet long. The latter are filled with a special freezing solution and house the cooling coils.

Science News Letter, December 2, 1944

⚙️ **FINE WIRES** used to suspend tiny mirrors in electric galvanometers are



measured to a millionth of an inch by embedding them in a plastic block which is then carefully cut so that the ends of the wire show on the surface. The picture shows the block being examined under a powerful microscope with micrometer eyepiece.

Science News Letter, December 2, 1944

⚙️ **PORTABLE** sterilizer to purify air in a sick-room is a bowl-shaped receptacle opening upward, containing an electric motor, fan and several germicidal

lamps. The air, driven between the lamps, is sterilized by ultraviolet rays. It may be mounted in the ordinary inverted-type floor lamp.

Science News Letter, December 2, 1944

⚙️ **GARDEN WEEDER** is a hoe-like tool which has teeth to grasp the weeds. The teeth are Y-shaped and have curved, dull edges which, when dragged forward close to the ground, grasp the weeds and pull them up by the roots.

Science News Letter, December 2, 1944

⚙️ **LETTER-OPENER** has two flat arms with a cutting blade between them, all fixed in the same handle. The letter is slipped between diverging lips at the ends of the arms, engaged by the blade and slit open.

Science News Letter, December 2, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 236.

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